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Docket No.: 2835-0168PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Marja TIITTA et al.

Application No.: NEW

Confirmation No.: N/A

Filed: May 16, 2006

Art Unit: N/A

For: CATALYST AND METHOD FOR THE
PREPARATION THEREOF

Examiner: Not Yet Assigned

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The PTO is requested to use the amended sheets/claims attached hereto (which correspond to Article 19 amendments or to claims attached to the International Preliminary Examination Report (Article 34)) during prosecution of the above-identified national phase PCT application.

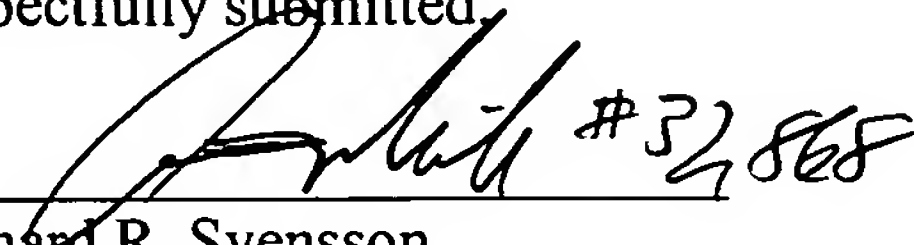
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §1.16 or 1.14; particularly, extension of time fees.

Application No.: NEW

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Respectfully submitted,

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Attachment(s)

10/579494

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The International Patent Office
PCT International Application

Claims /PCT/FI2004/000713/ 16.01.2006

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1. A method for the manufacture of a noble metal catalyst for hydrocarbon conversion, **characterized** in that the method comprises the following steps:
 - a) Pre-treatment of a support comprising a zeolite selected from medium and large pore zeolites having acid sites, at a temperature between 423 – 1173 K, and optional modification of the support;
 - b) Deposition of a noble metal selected from platinum, palladium, ruthenium, rhodium, iridium and mixtures and combinations thereof by gas phase deposition technique comprising vaporisation of the noble metal precursor selected from β -diketonates and metallocenes and reaction with the support, and
 - c) Heat treatment at oxidising or reducing conditions.
2. The method according to claim 1, **characterized** in that the noble metal is platinum.
3. The method according to claim 1 or 2, **characterized** in that the zeolite is selected from large pore zeolites having weak or medium strength of acid sites.
4. The method according to any one of claims 1 - 3, characterized in that the zeolite is selected from mesoporous aluminosilicates, crystalline aluminosilicates, crystalline aluminophosphates and crystalline aluminosilicophosphates.
5. The method according to any one of claims 1 - 4, characterized in that the zeolite is selected from MCM-41, Y- and beta-zeolites, mordenites, AIPO-5 and AIPO-11, SAPO-5 and SAPO-11.
6. The method according to any one of claims 1 - 5, **characterized** in that the support further comprises inorganic oxide, carbon related material or mixtures or combinations thereof.
7. The method according to claim 6, **characterized** in that the inorganic oxide is selected from silicon oxide, aluminum oxide, titanium oxide, zirconium oxide, tungsten oxide and magnesium oxide, preferably from silicon oxide and aluminum oxide.

AMENDED SHEET

8. The method according to claim 6, **characterized** in that the carbon related material is selected from activated carbon, graphite and carbon nanotubes.
9. The method according to any one of claims 1 - 8, **characterized** in that the noble metal precursor is $(\text{CH}_3)_3(\text{CH}_3\text{C}_5\text{H}_4)\text{Pt}$.
10. The method according to any one of claims 1 - 9, **characterized** in that the zeolite is MCM-41.
11. The method according to any one of claims 1 - 10, **characterized** in that in the first process step a) the support is pre-treated at a temperature of 423–1173 K, and in the second step b) the deposition is carried out in the presence of an inert carrier gas.
12. The method according to claim 11, **characterized** in that the inert carrier gas is nitrogen, helium, argon or methane.
13. The method according to any one of claims 1 - 12, **characterized** in that the modification in the first step a) is carried out by blocking part of available surface sites on the support with a blocking agent selected from alcohols, acetyl acetone, 2,2,6,6-tetramethyl-3,5-heptanedione, precursors of silicon oxide, aluminum oxide, titanium oxide, zirconium oxide, tungsten oxide and magnesium oxide, and nitrates.
14. The method according to claim 13, **characterized** in that the blocking agent is silicon tetrachloride, tetramethoxysilane, tetraethoxysilane, hexamethyldisilazane, hexamethyldisiloxane, aluminum chloride, aluminum ethoxide, aluminum (III) acetylacetonate, tris(2,2,6,6,-tetramethyl-3,5-heptanedionato)aluminum, trimethyl aluminum, triethyl aluminum, titanium tetrachloride, titanium isopropoxide, zirconium tetrachloride, tungsten oxychloride, tungsten hexachloride or tris(2,2,6,6-tetramethyl-3,5-heptanedionato) magnesium.
15. Use of the noble metal catalyst manufactured according to the method of any one of claims 1 - 14 in ring-opening, isomerisation, alkylation, hydrocarbon reforming, dry reforming, hydrogenation and dehydrogenation reactions, and preferably in ring-opening of naphthenic molecules.

16. A process for the manufacture of middle distillate diesel fuel, characterized in that a middle distillate feedstock is transferred to a reactor wherein it is allowed to react at a temperature of 283 - 673 K and under a pressure of 10 - 200 bar with hydrogen in the presence of a noble metal catalyst manufactured according to the method of any one of claims 1-14 to accomplish opening of naphthenes with two and multiple rings to produce isoparaffins, n-paraffins and mononaphthenes in the middle distillate region.